

IV.—*Notes on the Mollusca procured by the Italian Exploration of the Mediterranean in 1881.* By J. GWYN JEFFREYS, LL.D., F.R.S.

HAVING been lately at Florence, Professor Giglioli kindly offered me an opportunity of examining the Mollusca which were obtained in the Italian Expedition to the Mediterranean in 1881; and he requested me to publish a notice of the principal results in that department of zoology. His preliminary Report of the Expedition was published at the close of last year in the 'Atti del III. Congresso Geografico Internazionale,' and is highly interesting to all naturalists. It conclusively showed that the great abysses of the Mediterranean are not (as the lamented Professor Edward Forbes supposed) azoic, but that they abound in life of all kinds. This fact has been corroborated by the French exploration in the 'Travailleur' of another part of the Mediterranean, made in the same year, an account of which appeared in the 'Comptes Rendus' from the pen of Professor Alphonse Milne-Edwards. Fishes, Mollusca, Crustacea, Annelids, Echinoderms, Zoantharia, Corals, Foraminifera, and Sponges were amply represented in both of those expeditions from depths of from 500 to nearly 2000 fms.

Forbes's dredgings in the Mediterranean did not exceed in depth 230 fms.; Admiral Spratt dredged there living Mollusca in 310 fms.; and in the 'Porcupine' expedition of 1870 productive dredgings were made off the north coast of Africa at depths of 1415 and 1456 fms. These were the only deep-water researches by dredging in the Mediterranean previously to last year. It was therefore clear that the bottom of this famous sea or marine lake had never been properly investigated for zoological purposes.

The Italian surveying-ship 'Washington,' under the command of Captain Magnaghi, commenced operations on the 1st of August, and returned to Genoa on the 6th of September, 1881. The commander is an experienced hydrographer and a thorough man of science. Professor Giglioli, of Florence, who is well known as an eminent and accomplished zoologist, had the scientific charge of the expedition as naturalist. The course of exploration was from Maddalena, round Sardinia to Naples, and thence to the western coast of Sicily. There were thirty-three stations and thirty-eight dredgings; and the depths at which dredgings were made ranged from 60 to 3630 metres, or from about $32\frac{1}{2}$ to 1970 fms.

As regards the Mollusca, the number of specimens pro-

cured was not great; but many of the species were extremely interesting. I will now proceed to mention some of them. All the depths having been recorded in metres, I will render them in fathoms by adding a twelfth part to each metre, so as to correspond nearly with the English yard measure, of which two make a fathom*.

BRACHIOPODA.

†*Terebratula vitrea*, Born.

Very fine specimens occurred in 214 fms.; one of them is $1\frac{6}{10}$ inch long. An oblong variety came from 841 fms., and the variety *sphenoïdea* from 217 fms. The inside ribs of the upper or deeper valve are sometimes visible on the outside, owing to the semitransparency of the shell. As to the distribution of this and other species in space and time, I would refer to my papers on the Mollusca of the 'Lightning' and 'Porcupine' expeditions in the 'Proceedings of the Zoological Society of London' for 1878, 1879, 1880, and 1881.

CONCHIFERA.

†*Amussium Hoskynsi*, Forbes.

From 214 to 609 fms.

†*Arca obliqua*, Philippi.

From 123 to 544 fms. Described by the author of the species as a Tertiary fossil.

†*Arca pectunculoïdes*, Scacchi, var. *septentrionalis*.

From 337-464 fms.

†*Leda messanensis*, Seguenza.

From 217 to 544 fms.

†*Nucula ægeensis*, Forb.

From 1521-1536 fms.

†*Nucula corbuloïdes*, Seg.

From 1521-1536 fms.

†*Limopsis minuta*, Ph.

From 217 fms.

* The species having a † prefixed to their names are Upper Tertiary fossils of Italy.

†*Limopsis pygmæa*, Ph.*Pectunculus pygmæus*, Moll. Sic. i. p. 63, t. v. f. 5.

From 217 fms. A single but fresh valve. A Pliocene fossil of Italy and the English Crags; hitherto unknown as recent or living. The specimen mentioned in the supplement to 'British Conchology' (vol. v. p. 175) as from Corsica is *L. minuta*.

Malletia obtusa, M. Sars.

From 337-464 fms.

Malletia cuneata, Jeffreys.

From 337 to 1536 fms.

Axinus planatus *, Jeffr.

SHELL triangular, expanded, and somewhat flattened, thin, lustreless, and opaque: *sculpture*, an angular ridge running down the middle, with a shallow furrow on the anterior side, besides regular slight concentric riblets in the line of growth, and numerous intermediate minute striæ: *colour* whitish: *epidermis* filmy and scarcely perceptible: *margins* rounded in front, sinuous (as in *A. flexuosus*) on the anterior side, obliquely and abruptly truncated on the other side, deeply excavated or concave below the beak: *beaks* prominent, pointed, and incurved: *lunule* semicordate, with a thickened edge: *ligament* enclosed in a short, narrow, and curved groove: *hinge-line* triangular, occupying only a small portion of the entire circumference: *hinge-plate* thick: *teeth* none: *inside* glossy, exhibiting the obverse of the riblets but no longitudinal striæ: *muscular scars* indistinct. L. 0·55, B. 0·5.

From 432-544 fms.; a single valve only and the fragments of another.

With this species was dredged an unusually large and rather flattened valve of what I should consider *A. flexuosus*, var. *polygona*, which shows the same longitudinal striæ on the inside that, according to the Abbé Brugnone, distinguish *Ptychina biplicata* of Philippi from *A. flexuosus*.

A. transversus (*Lucina transversa*), Bronn, has a different shape, texture, and sculpture.

†*Axinus orbiculatus*, Seg.

From 214 fms.

†*Pecchiolia granulata*, Seg.

From 127 to 301 fms.; of large size.

* Flattened.

†*Pholadomya Loveni*, Jeffr.

From 85 to 1217 fms. Perfect and large specimens at the last-mentioned depth, measuring upwards of an inch in length.

†? *Necera obesa*, Lov.

From 337 to 1536 fms.

†*Necera costellata*, Deshayes.

From 817 fms.

SOLENOCONCHIA.

†*Dentalium agile*, M. Sars.

From 86 to 1963 fms.; widely distributed. One specimen from between 1500 and 1600 fms. is more than 2 inches long. I now find that, compared with *D. striolatum* or *abyssorum*, the present species is more slender and not so strongly ribbed, and that the curve is more gradual and not abrupt towards the point or base. Perfect specimens of both species have a short terminal pipe within the slit and occasionally issuing from a truncated and thickened base, as in *D. dentalis* and *D. tarentinum*. Philippi was the first to describe *D. agile* from the Italian Tertiaries as *D. incertum* of Deshayes; but it is not the last-named species. It was dredged in the 'Porcupine' and 'Travailleur' expeditions off the Lusitanian coasts.

†*Dentalium striolatum*, Stimpson.

From 200–277 fms. *D. brevifissum*, Brugnone.

GASTROPODA.

*Emarginula multistriata**, Jeffr.

SHELL helmet-shaped, somewhat compressed at the sides, rather thin, lustreless, and opaque: *sculpture*, numerous slight ribs, which radiate from the beak or apex to the front margin on every side; usually, but not regularly, a smaller alternates with a larger rib; the crests are studded with rather distant tubercles, giving a prickly appearance; the intervals between the ribs are filled with minute and close-set transverse striæ: *colour* whitish: *margins* slightly notched by the termination of the ribs: *beak* small, incurved, placed perpendicularly to the front margin: *slit* short, but broadish: the fissural furrow is filled up with crowded arched septa or plates: *inside*

* Much striated.

glossy, showing the impression of the external sculpture. L. 0.5, B. 0.3.

From 217 fms.; a single specimen. Also from the 'Porcupine' expedition of 1870, off the western coasts of Spain, in from 292 to 374 fms.

This differs from *E. cancellata*, Ph., in being proportionally higher, narrower or compressed at the sides, and thinner; the beak overhangs the front margin; the ribs are slighter and more numerous, and the intermediate striæ twice as many. It is also distinct from *E. tuberculosa*, Libassi, and *E. confusa*, Seg., in sculpture and other respects.

†*Trochus Ottoi*, Ph.

Moll. Sic. ii. p. 227, t. xxviii. f. 9.

From 214 to 970 fms. Also dredged in 'Porcupine' and 'Travailleur' expeditions, as well as in the 'Blake' or United-States expedition. This and the next two species were originally described as fossils of the South-Italian tertiary.

†*Trochus Wiseri*, Calcara.

Giorn. Maur. 1841, p. 31, t. iv. f. 14.

From 244 to 544 fms. *T. gemmulatus*, Ph., 1844, and other synonyms. Off the Gulf of Bona, in 1456 fms. ('Porcupine' expedition); Bay of Biscay ('Travailleur' expedition).

†*Turbo filusus*, Ph., var. *glabrata*.

Moll. Sic. ii. p. 155, t. xxv. f. 4 (as *Trochus filusus*); var., ii. p. 226, t. xxviii. f. 1 (as *Trochus glabratus*).

From 217 fms. North-Atlantic expeditions of 'Porcupine' in 1870, and 'Travailleur' in 1881. The operculum shows that this species belongs undoubtedly to *Turbo*, and not to *Trochus*.

†*Hela tenella*, Jeffr.

Lacuna tenella, Brit. Conch. v. p. 204, pl. ci. f. 7.

From 807 to 1536 fms. Also throughout the North Atlantic.

Odostomia speciosa, H. Adams.

Turbonilla speciosa, Proc. Zool. Soc. 1869, p. 274, pl. xix. f. 11.

From 214 fms. Also from 'Porcupine' expedition, off the Atlantic coast of Spain. Query *Turbo plicatilis* of Brocchi?

† *Trophon multilamellosus*, Ph.

Murex multilamellosus, Moll. Sic. ii. p. 182, t. xxvii. f. 8.

From 200–277 fms. Also from the Atlantic cruise of the 'Porcupine' in 1870. Originally described as a Calabrian fossil.

† *Columbella costulata*, Cantraine.

Fusus costulatus, Diagn. Moll. (1837), p. 20.

Buccinum acutecostatum, Ph. Moll. Sic. ii. (1844) p. 192, t. xxvii. f. 14.

Buccinum testæ, Aradas, Descr. Conch. foss. Gravitelli (1847), p. 28.

Columbella halicæti, Jeffr. B. C. iv. (1867) p. 356; v. (1869) p. 219, pl. cxviii. f. 3.

From 85 to 544 fms. Has an extensive distribution in the North Atlantic. A Sicilian and Calabrian fossil; first described by me as recent or living.

† *Defrancia torquata*, Ph.

Pleurotoma torquatum, Moll. Sic. ii. p. 171, t. xxvi. f. 14.

From 217 fms. Also from 'Porcupine' expedition of 1870, in the Atlantic. Originally described as a Calabrian fossil.

*Defrancia nodulosa**, Jeffr.

SHELL spindle-shaped, slender, rather solid, glossy, and semitransparent: *sculpture*, sharp and oblique longitudinal ribs, of which there are twenty on the body-whorl, besides numerous intermediate concentric striæ, those on the lower half of the last or body-whorl being thread-like, uninterrupted, and oblique; each whorl has also below the fissural band a sharp keel or ridge, which is somewhat knotty or jagged at intervals, owing to the junction of the ribs and striæ; the fissural band is crossed by arched striæ corresponding with the ribs, of which they appear to form a continuation; the top whorls have the same kind of arched striæ disposed lengthwise: *epidermis* none: *colour* white, with a faint tinge of yellowish-brown on the apex: *spire* long, graceful, bluntly pointed: *whorls* 8, moderately convex; the last is not quite equal in length to the rest of the spire; apical whorls rounded: *suture* deep: *mouth* oblong, flexuous: *canal* rather long and wide: *outer lip* curved, sharp-edged: *fissure* wide and deep, regularly curved: *inner lip* smooth: *pillar* long, slightly flexuous. L. 0.35, B. 0.15.

From 611 to 1216 fms.

* Somewhat knotty.

Three specimens. Also from the 'Porcupine' expedition of 1870, off the coast of Portugal in 795-994 fms., and in the Mediterranean in 1415-1456 fms.

*Defrancia tenella**, Jeffr.

SHELL oval, tapering at first towards the apex, but becoming disproportionately broad towards the base, very thin and fragile, of a dull hue, and semitransparent: *sculpture* none, except a few slight and indistinct spiral striæ and occasional lines of growth; the top whorls are minutely and closely reticulated by curved striæ, as in other species of the present genus: *epidermis* not perceptible: *colour*, for the most part whitish, the first four whorls being reddish-brown: *spire* short, sharply pointed: *whorls* 7, convex; the last is twice the size of all the other whorls put together; apex conical: *suture* deep, not concave or sunken: *mouth* oval, flexuous: *canal* short and wide: *outer lip* curved and having a sharp edge: *fissure* remarkably wide and deep, forming an oblique curve: *inner lip* glazed: *pillar* long, and sloping towards the canal. L. 0.2, B. 0.15.

From 1963 fms.

A single and perfect specimen of this beautiful little shell. It is allied to a species which I have named *exquisita*, dredged in the 'Porcupine' and 'Travailleur' expeditions off the western coast of Lusitania, in about 1000 fms.; but the last-named species is distinctly cancellated, and has a much narrower and longer fissure.

Defrancia convexa†, Jeffr.

SHELL spindle-shaped, rather thin, lustreless, and opaque: *sculpture* numerous, slight, thread-like and regular spiral striæ, which are alternately larger and smaller; those on the base are more close-set and finer; there are no longitudinal ribs; but the upper whorls have a few knob-like prominences in the middle, which may be the remains or traces of ribs, and they give a bluntly angular appearance to those whorls; the lines of growth are flexuous; the fissural groove, which lies immediately below the suture, is somewhat excavated, and is marked by numerous and regular curved striæ: *colour* whitish: *whorls* 8-10, convex: *suture* deep: *mouth* oblong: *canal* of moderate length: *pillar-lip* smooth and enamelled. L. 0.85, B. 0.35.

From 217 fms.

* Delicate.

† Rounded.

An imperfect but characteristic specimen. It differs from *D. Leufroyi* in having a longer spire, regular and fine transverse striae, no ribs, and merely a few nodulous markings on the upper whorls; the groove is more distinct, and the canal is not so short and abrupt. *Pleurotoma inflata* of Cristofori and Jan has the same longitudinal ribs as *D. Leufroyi* (which is not given in their catalogue); and I consider it a variety of the last-named species.

†*Pleurotoma modiolus*, Cristofori & Jan.

Fusus modiolus, Cat. (1832), p. 10.

Pleurotoma carinatum, Ph. Moll. Sic. ii. (1844) p. 176, t. xxvi. f. 19.

From 217 fms. Also North Atlantic. First described and known as an Italian fossil.

†*Cylichna ovata*, Jeffr.

Cylichna umbilicata; var. *conulus*, B. C. iv. p. 414.

From 337–464 fms. Throughout the North Atlantic, and fossil in the South-Italian Tertiaries. Not *Bulla conulus* of Deshayes, nor *C. striatula* of Forbes with several synonyms.

Cylindrobulla fragilis, Jeffr.

Cylichna fragilis, Ann. & Mag. Nat. Hist. 1856, xvii. p. 188, pl. ii. ff. 16, 17.

From 1521–1536 fms. Spezzia, and dredged by Mr. McAndrew on the Atlantic coast of Spain. The 'Washington' specimens are adult; the largest is $\frac{6}{10}$ inch long. They are microscopically and regularly striated in a transverse or spiral direction. I cannot agree with the Messrs. Adams that Fischer's genus *Cylindrobulla* is the same as *Lophocercus*, nor with Monterosato in considering it a section of *Acera*; although the generic characters require some amendment.

†*Actæon pusillus*, Forb.

Tornatella pusilla, Rep. Æg. Invert. p. 191.

From 217 fms. Also North Atlantic and a Sicilian fossil. Scarcely distinguishable from *A. Noë* of the English and Belgian Crags, and of the Icelandic Tertiary or Post-tertiary deposits, except in respect of size.

†*Scaphander punctostriatus*, Mighels & Adams.

Bulla punctostriata, Boston Journ. Nat. Hist. vol. iv. (1842) p. 43, pl. iv. f. 10.

Scaphander librarius, Lovén (1846).

From 85 to 1536 fms. Also throughout the North Atlantic, and a Sicilian fossil.

I am delighted to find that science will be further benefited by another Italian exploration of the Mediterranean in the course of this summer.

V.—*Description of a new Genus and Species of Frogs of the Family Ranidæ.* By G. A. BOULENGER.

NYCTIXALUS, g. n.

Pupil vertical. Tongue free and deeply notched behind. Vomerine teeth none. Tympanum distinct. Fingers free, toes with a rudiment of web; tips of fingers and toes dilated into regular disks. Outer metatarsals united. Omosternum and sternum with a bony style. Terminal phalanges obtuse.

Closely allied to *Megalixalus*, but distinguished by having the toes nearly free.

Nyctixalus margaritifer, sp. n.

Head rather large, broader than the body; snout prominent, the tip obliquely truncate backwards and downwards; nostrils close to the tip of the snout; canthus rostralis angular; loreal region concave; interorbital space concave, broader than the upper eyelid; eye large; tympanum very distinct, nearly as large as the eye. Limbs slender; fingers rather long, first shorter than second; toes short, with a slight web at the base, extending as a narrow fringe along the sides; subarticular tubercles moderately developed; a very indistinct inner metatarsal tubercle. If the hind limb is carried forwards along the body, the tibio-tarsal articulation reaches the tip of the snout. Upper surface with very small pearl-like scattered tubercles; upper eyelid strongly tubercular; belly and lower surface of thighs granulate. Dark brown above and beneath; a yellow spot on each scapula; other, smaller, yellow spots on the limbs, fingers, and toes; belly marbled with yellow. Male without vocal sac. From snout to vent 35 millim.

One male specimen in the Royal Museum, Brussels. Purchased as being from the East Indies.